American Codes and Ciphers

By Frederic J. Haskin.

In the archives of the department of state at Washington, there is preserved an apparently commonplace letter written to John Jay from Paris by one Timothy Jones. The letter is dated just after the outbreak of the American revolution and apparently contains only some information concerning foreign markets and crops. One cannot but wonder why this document is kept carefully in the archives of the government.

Careful examination of the sheet of parchment upon which the letter is written, however, will show that the visible letter occupies less than half the available surface and that very fine scratches are to be seen upon the remainder of the sheet. The scratches are the remains of the first official code dispatch ever sent to the Congress of the United States by its confidential agent in Paris, Samuel Deane. The hidden letter is the first "code dispatch" that ever figured in the destiny of the United States.

Time has so dimmed the invisible ink with which the secret portion of the letter was written that it is impossible to make out its contents. Fortunately, however, there has been preserved a copy of the hidden message which explains the reason for the secrecy.

What the Message Said.

Deane's secret message read: "I shall send you, in October, clothing for 20,000 men, 30,000 fusils, one hundred tons of powder, two hundred brass cannon, twenty-four brass mortars, with shells, shot, lead, etc., in proportion. I am to advise you that if, in future, you will give commissions to seize Portuguese ships, you may depend upon the alliance and friendship of Spain. Let me urge this measure. Much may be gained, nothing may be lost by it. Increase, at all events, your navy. I will procure, if commissioned, any quantity of sailcloth and cordage. A general war is undoubtedly at hand in Europe and, consequently, America will be safe, if you baffle the arts and arms of the two Howes through the summer. Everyone here is in your favor."

It is easily seen that such a letter, had it fallen into the hands of the British, might have seriously delayed the progress of the revolution. Therefore, the invisible ink and the harmless letter on the upper part of the sheet of the parchment.

Since Deane reported progress from Paris, agents of the state department and other branches of the government have made use of many kinds of secret writing, simple and complex, to keep the authorities in Washington in touch with foreign activities. The necessity for absolute secrecy in guarding the actions of the diplomatic agents and the exigencies of war have alike compelled the use of ciphers of various kinds, from the "official code" of the department of state, which is never used for any really important secret message, to the codes of the army and navy, which are known to but few of the higher officials of the service.

Code Books on Sale.

One hears much of the value placed upon the state department code and the official ciphers of other nations. In diplomatic circles, however, it is an open secret that code-books of all the world powers are on sale in Paris, but no one cares to buy them for the reason that they are never used when any important message is to be transmitted.

The United States government, as such, has no official cipher or code to be used by the entire government. For ordinary commercial purposes one or the more common codes is used, but the state, war and navy departments each has its own code, which is changed at least once a year and sometimes once a month.

At the time of the crisis in the Mexican trouble, for example, the code used by the state department for communicating with its agents in the interior of Mexico was changed once a month, according to a preconcerted schedule which covered the entire year. A simple change in the arrangement of characters renders this code utterly incomprehensible to anyone who does not possess the key, even though he have the code-book at hand.

The code of the navy department consists of a combination of cipher words and numerals representing words and phrases, based on the accepted principle of commercial codes. Its operation is further complicated by two translations of characters which are designed to baffle anyone not in the secret.

In Canvas Bag.

The codebook of this cipher is always kept in a canvas bag, lined with zinc and heavily weighted. This bag is placed in the personal custody of the commanding officer of the ship, with orders to throw the bag and book overboard in the event of capture by the enemy. The advent of wireless has made this precaution double necessary, for the solution of the enemy's cipher in time of war might easily turn the tide of victory. So careful is the navy department in this respect that wireless dispatches are never given to the press in exactly the words in which they were sent. They are first paraphrased in order to prevent anyone who might have intercepted the wireless from obtaining hints as to the code used.

Only one American code-book has ever been captured by the enemy—the copy on board the frigate, Chesapeake, which now reposes in the British museum. Captain Lawrence, it will be remembered, was wounded early in the engagement and was unable to throw the code-book overboard before the British took possession of the ship.

The cipher of the war department is very simple in its nature and, by virtue of this simplicity, ease of operation, instructibility and rapidity with which a new key may be substituted, it is said to hold first place among military ciphers of the world. Army officers who have used other codes say that none of them can equal the war department cipher now in use.

In a general way this cipher may be described as an ingenious method of transcribing the order of words in a message and further obscuring the sense by the systematic interpolation of irrevelant words and the introduction of names—some with a meaning, others without. The variety of distortions is therefore very large and whenever a copy of the cipher is captured another can be supplied and communicated to all those interested in a very short time.

Celluloid Device.

Another American military cipher, used throughout our army, is also used in a modified degree by the Germans. It consists of a circular piece of celliloid, fastened to another and larger disc of the same materials, much as the dial on a safe is superimposed on the stationary dial. The letters of the alphabet appear on each disc and, by revolving the smaller disc, the letters are made to take on different values on the larger disc. By shifting the smaller piece of celluloid, a known number of spaces every ten words or so the message becomes so complicated that, should it fall into alien hands, it would be almost impossible to decipher it for some days, by which time the information contained would probably be valueless.

As used in the American army the smaller disc is moved a certain number of degrees every hour and a code word is placed in the message to show the time of writing. In deciphering the message, therefore, one need only use the "combination word" to determine the relative position of the letters and the "decoding" is easy.

In the library of the navy department are a large number of Confederate code dispatches, intercepted by Union agents and sent to Washington to be decoded. Owing to the fact that these messages were written in the "rectangular cipher" which is practically impenetrable unless one possesses the code-word or key, the dispatches retained their secret until a few years ago when Charles W. Stewart, librarian of the navy department, and an authority on ciphers, read the report of Bertillion's testimony during the Dreyfus trial.

"The word 'interest,'" Bertillion testified, "is an excellent code-word for the rectangular code, inasmuch as it contains two 't's' and two 'e's.'"

Code Solved.

Merely from curiosity, Stewart determined to try the word "interest"—the same in French as in English—on the Confederate code messages. To his great surprise, the experiment was a success and the apparently meaningless jumble of letters resolved themselves into important messages from the Confederate leaders. "Manchester Bluff," "Complete Victory," and "Interest" were the three code words used by the Confederates in transmitting messages of this character. The discovery of the third word resulted in the decoding of all the messages.

An amusing error crept into the navy department flag code, which was entirely revised at the commencement of the Civil war. The revision was done in a hurry and apparently by men who were ignorant of the needs of the navy. The very first signal given under the new code was the use of the white flag, or flag of surrender, as the signal for action. Fortunately, the new code did not obtain a wide circulation before being recalled and again revised.

Probably the most ingenious cipher device yet invented was the product of the imagination of a Connecticut Yankee who applied for a patent upon his invention, but was rudely rebuffed by the officials of the patent office. According to this genius, one need only speak the message into a long hollow tube, hermetically sealed at one end. The other end was to be closed as soon as the message had been spoken.

"The voice," claimed the inventor, "will remain in the tube until the latter is opened and the removal of the seal at the end first closed will permit the spoken words to come out in regular order."

An Englishman has invented a machane for redressing worn wooden paving blocks at a rate of 1,000 an hour, so that they may be used again.